

lected and introduced with the feedings. Oatmeal broths and other farinaceous-bearing fluids can be safely given if desired. In threatened acidosis, alkalies may be introduced as readily as per rectum. This type of feeding can be continued indefinitely and the patient brought back to good physical condition before a secondary operation need be performed. It also prevents contraction of the gut below the fistula, a great help in the after-treatment of these cases.

**CONCLUSIONS.** The problem of nutrition in high intestinal fistulas is a serious one. The loss of fluids and products of digestion steadily lowers the patient's resistance to infection, and so weakens his physical condition that operative interference is extremely hazardous. The administration of small amounts of food by mouth does not materially improve the condition. Mechanical measures to conduct the fluids from the upper to the lower intestinal loop or to occlude the fistulous tract are successful in only a very small number of cases. Rectal alimentation has many limitations, chief of which are the failure of absorption of sufficient calories and the short time the colon will tolerate nutrient enemas. Enteric administration of foodstuffs through a small, soft catheter, inserted by way of the fistula into the efferent loop, is successful. By this method sufficient calories are utilized to maintain a good, physical condition and to build up an emaciated patient, so that he can withstand necessary operative treatment.

## LATER STAGES OF SO-CALLED WAR NEPHRITIS.

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THE unusual number of cases of acute nephritis occurring in the various armies overseas has been the subject of much comment and study. It has been maintained by some authors; notably Ameuille,<sup>1</sup> that war nephritis constitutes a hitherto unrecognized clinical entity, differing in some respects from nephritis as ordinarily seen in civil life. This opinion is not shared by others. Christian,<sup>2</sup> after reviewing the literature of the subject, concludes that "war

<sup>1</sup> Translation by Mosenthal: Jour Urol., 1918, ii, 51.

<sup>2</sup> Prog. Med., 1919 xxi, 135.

nephritis" is not a new disease entity but represents a wide variety of the clinical manifestations of acute nephritis.

During the past few months the Base Hospital at Camp Lee, Va., has received a number of such patients in whom the duration of the disease averaged a little under four months. The clinical findings of these patients at this stage of convalescence offer some data bearing upon the course and prognosis of the disease. Our cases were studied too late to present much evidence bearing on the question of the nature of the original attack.

Thirty-seven patients were received at this hospital from overseas with a diagnosis of nephritis. Our investigation of these patients brought out the following facts:

*Period Since Onset.* The period that had elapsed since the onset of the disease until admission varied between two and seven months, averaging 3.8, but in 75 per cent. of the cases ranged from three to five months. The length of stay in the hospital averaged a little over three weeks, so that most of the observations were made about the fourth month.

*Past History of Nephritis.* 3 of the 37 patients had had previous attacks of nephritis. Of these 2 recovered from the present attack and 1 was found to have well-developed chronic nephritis.

*Edema.* 35 of the 37 had edema at the onset. Of the 2 who did not, 1 had a chronic nephritis, dying at this hospital of uremia, and 1 had apparently recovered. At this hospital edema was found in but 2, both having chronic nephritis.

*Focal Infection.* Teeth and tonsils were examined in 26 cases. Foci of infection were found in 13 of these (50 per cent.), tonsillar disease being present in 10 and root infection in 4.

*Albuminuria.* Albuminuria was found to be present in 31 cases (83 per cent.), and persisted in 24 (64 per cent.). In the absence of other indications of nephritis these patients were considered to have recovered.

*Cylindruria.* Cylindruria persisted in 16 cases (43 per cent.). This factor was also practically disregarded.

*Sodium Chloride Excretion.* Sodium chloride excretion was found to be normal in nearly all the cases in which it was estimated. In 26 patients the average excretion was 9.5 gm., only 7 excreting below 7 gm., all of these being over 5 gm. except one, who excreted but 0.5 gm. during an acute exacerbation of the disease, the salt intake at this time, of course, being much restricted.

*Nitrogen Excretion.* Nitrogen excretion was estimated while patients were on a full ward diet in 24 cases. The average output was 10 gm. In 7 cases the output was below 8 gm., the lowest figure being 6 gm.

*Twenty-four-hour-urine Output.* The urine was measured in 34 cases. It exceeded 1500 c.c. in 7 cases. In 5 of these 7 cases there was ample evidence of impaired kidney function; 1 showed

nycturia and hyposthenuria as the only other evidence of kidney involvement, while 1 was normal in every other respect. Oliguria was pronounced in 3 cases during acute exacerbations of apparently chronic nephritis; 11 excreted less than 1000 c.c. The average twenty-four-hour-output was 1229 c.c.

*Amount of Day and Night Urine.* The amount of urine excreted between 8 A.M. and 8 P.M. was compared with the amount excreted between 8 P.M. and 8 A.M. in 33 cases. The night urine exceeded 50 per cent. of the day urine in 27 cases (81.8 per cent.). It exceeded 75 per cent. of the day urine in 19 cases (57.5 per cent.). In 4 it equalled or exceeded the day urine.

*Specific Gravity of Day Urine.* Maximum was over 1.018 in 28 cases, between 1.015 and 1.018 in 1 case and under 1.015 in 7 cases.

*Specific Gravity of Night Urine.* This was above 1.018 in 18 cases, between 1.015 and 1.018 in 3 and below 1.015 in 13 cases. Of the 13 cases with a night urine below 1.015, 12 had other manifestations of kidney involvement and 1 did not. Of the 3 between 1.015 and 1.018, 2 had recovered and 1 still showed other evidences of pathology; 76 per cent. of the active cases and 17 per cent. of the recovered passed night urine of a specific gravity of less than 1.018.

*Two-hour Variation in Concentration.* This variation was studied in 35 cases. Variations of less than 6 points were noted in 13 patients. Of these 7 still had nephritis and exhibited decidedly lower maximum concentrations than the 6 who had recovered. In this series fixation of specific gravity without hyposthenuria appeared to be of little significance.

*Blood Urea.* Blood urea was estimated in 35 cases; of these 11 showed a concentration of 35 mg. or more per 100 c.c., while 24 showed lower figures. Two of the 11 with blood urea above 35 mg. (38 mg. and 40 mg.) had apparently recovered while the other 9 still had nephritis. Of course a number of patients with blood urea below 35 mg. were definite nephritis cases. The findings are tabulated in Table I.

TABLE I.—BLOOD UREA (MG. PER 100 C.C. BLOOD).

330 mg.	1 (died)
230 " (later reduced to 110)	1
190 "	1
134 "	1
80 to 90 "	1
50 to 60 "	1
40 to 45 "	1
35 to 40 "	4
30 to 35 "	3
25 to 30 "	2
20 to 25 "	9
25 to 20 "	6
Below 15 "	4

*The Phenolsulphonephthalein Test.* This test was done in 36 cases. Table II shows the results. A moderate depression was not uncommon in soldiers who showed no other signs of nephritis. Thus of the 8 with a reading between 40 and 50 per cent., 5 had apparently recovered. Of 11 below 40, 2 had recovered and 9 had not.

TABLE II.—PHENOLSULPHONEPHTHALEIN OUTPUT IN TWO HOURS AND TEN MINUTES.

70 to 80 per cent.	1
60 to 70 "	4
50 to 60 "	12
40 to 50 "	8
30 to 40 "	3
20 to 30 "	1
10 to 20 "	1
0 to 10 "	6

*Systolic Blood-pressure.* Systolic blood-pressure was estimated in 37 cases. Of the 12 cases with a reading of 140 or over, 10 (83 per cent.) still had nephritis, the other 2, in whom the maximum reading just touched 140, showed no other signs of nephritis. On the other hand 6 (24 per cent.) of the 25 whose blood-pressure never reached 140 were nevertheless considered active cases. They were much milder in type, however, than the patients with higher readings, and were practically all convalescing and seemed quite likely to recover entirely.

TABLE III.—SYSTOLIC BLOOD-PRESSURE.

Over 200 . . . . .	2
190 to 200 . . . . .	0
180 to 190 . . . . .	2
170 to 180 . . . . .	1
160 to 170 . . . . .	2
150 to 160 . . . . .	1
140 to 150 . . . . .	4
130 to 140 . . . . .	9
120 to 130 . . . . .	8
110 to 120 . . . . .	6
100 to 110 . . . . .	2

*Diastolic Pressure.* Diastolic pressure exceeded 100 in 8 cases; 6 of these were well-marked cases of nephritis, 1 had slight corroborative evidence of activity and 1 had apparently recovered; 11 active cases had a diastolic pressure below 100.

*Eye-grounds.* Four showed pathology in the eye-grounds. Hemorrhages were found in 2, albuminuric retinitis in 2, retinal edema in 1 and papilledema in 1. They were all well-marked cases.

*Anemia.* A moderate degree of anemia was common. The erythrocytes were counted in 22, of whom 17 had less than four million.

Four to five million was the commonest count. The average was 4,147,500.

TABLE IV.—ERYTHROCYTES.

1,000,000 to 2,000,000	1
2,000,000 to 3,000,000	2
3,000,000 to 4,000,000	5
4,000,000 to 5,000,000	9
5,000,000 to 6,000,000	5

*Outcome.* A diagnosis in these patients was determined by the complete picture in each case, no one factor exclusively being considered pathognomonic. Of the 37 cases, 19 were discharged as having completely recovered and 18 showed definite evidence of kidney pathology. The time that had elapsed since the onset of the disease was practically identical in these two groups, averaging 3.85 months for the former and 3.75 months for the latter. Of the 18 active cases, 1 died of uremia, 8 presented the picture of well-established, chronic, interstitial nephritis and 9 showed less distinctive features and seemed to have a fair chance of ultimate recovery.

**SUMMARY.** 1. Thirty-seven cases of nephritis contracted overseas were studied at a period averaging four months.

2. One-half have recovered, one-quarter have developed chronic nephritis (with one death), one-quarter still have nephritis but may ultimately recover.

3. Persisting albuminuria is common but is considered of little prognostic significance.

4. Polyuria is not uncommon, and when it occurs is a valuable sign.

5. Relative increase of night urine is practically constant in active cases and is not infrequently the only anomaly in the apparently recovered.

6. Blood urea above 35 mg. per 100 c.c. usually meant nephritis, as proved by other factors. Normal readings were frequently found in active cases.

7. Moderate reductions of phenolphthalein output is not an uncommon finding in those patients who have apparently recovered.

8. An elevated blood-pressure proved the most reliable single sign.

9. A moderate degree of anemia is extremely common.